



Transportation Synthesis Report

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Transportation Workforce Development

Prepared for
WisDOT Research Administrator

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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT staff. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related research and news. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

REQUEST FOR REPORT

During the past five years state transportation agency leaders have become increasingly concerned about their personnel needs, in the near term as well as the long term. An aging workforce and a rapidly changing business environment require new approaches to employee recruitment, retention and training. We were asked to review and summarize available information that could be of use to state DOT managers.

SUMMARY

The **Chronology** of events and publications provides a quick look at the range and intensity of effort that has been applied to workforce development in the transportation sector. Information about **FHWA's Office of Professional and Corporate Development**, headed by Associate Administrator Joe Toole, shows how the office fits into FHWA's organizational structure. The **Website on Transportation Workforce Development** is a comprehensive resource that we use to organize and summarize several of the documents related to this issue. We provide **Links to Documents** listed in the chronology.

CHRONOLOGY OF PUBLICATIONS AND EVENTS (Details and links below)

- **1999 September** – New Mexico DOT study of 50 states' human resources practices
- **2001 May** – "Managing Change in State Departments of Transportation: Innovations in Work Force Strategies," NCHRP Project 20-24(14)
- **2001 Fall** – National Workforce Development Framework
- **2001 July/August** – "Help Wanted – Meeting the Need for Tomorrow's Transportation Work Force," article in *Public Roads*
- **2002 May** – National Workforce Summit
- **2002 November/December** – "Filling the Pipeline," article in *Public Roads* describing the Summit
- **2003 January** – Fifth Annual Forum on Transportation Education and Training, TRB Committee on Transportation Education and Training
- **2003 June** – International Scan. "European Practices in Transportation Workforce Development"
- **2003** – "Recruiting and Retaining Individuals in State Transportation Agencies," NCHRP Synthesis 323
- **2003** – "The Workforce Challenge: Recruiting, Training, and Retaining Qualified Workers for Transportation and Transit Agencies," TRB Special Report 275
- **2003 November/December** issue of TR News, article summarizing TRB Special Report 275.
- **2003** – "Innovative Practices in Workforce Development for State Departments of Transportation," NCHRP 20-3, Task 163.
- **2005 April** – AASHTO workshop for state DOT Human Resources Directors and Training Directors at the meeting of the AASHTO Subcommittee on Personnel and Human Resources in Denver, CO. This half-day workshop, led by Tom Warne, was meant to provide input from DOT human resources professionals for

identifying the in-service needs of state DOTs. (Information provided by Nancy Richardson, chair of the subcommittee, Iowa DOT Director of Operations and Finance, 515-239-1340.)

- **2005 Summer** – CEO Workforce Seminars at each of the four AASHTO regional summer meetings will be conducted by Tom Warne (801-302-8300 or 801-541-2619) to gather input on how to equip future DOT employees with the necessary skills for the DOTs of the future, followed by a final report and possible workforce summit later this year.

FHWA OFFICE OF PROFESSIONAL AND CORPORATE DEVELOPMENT

The Office of Professional Development and the Office of Corporate Development were merged in October 2004. Joe Toole provides executive direction as associate administrator for the new office. See its mission and detailed descriptions of its 14 functions in [FHWA Order M 1100.1A, CHG 37](#):

- | | |
|--------------------------------------|-------------------------------------------------------------|
| • Advocacy | • Workforce development |
| • Strategic planning | • Technology transfer (lead office for LTAP) |
| • Outreach and consultation | • Knowledge management and transfer |
| • Quality and continuous improvement | • Innovation |
| • Program review and evaluation | • National Highway Institute |
| • Process management and assistance | • Partnerships and formal agreements |
| • Information and analysis | • Universities and colleges programs (lead office for UTCs) |

See [FHWA's Organization Chart](#) showing 12 Headquarters offices, including the Office of Professional and Corporate Development.

FHWA'S WEB SITE ON TRANSPORTATION WORKFORCE DEVELOPMENT

<http://www.nhi.fhwa.dot.gov/transworkforce/>

Maintained by FHWA's Office of Professional and Corporate Development, this Web site is a comprehensive resource with current information on most of the significant activities under way related to workforce issues in transportation. Below are summaries of the information contained in each of the major areas of the site.

Overview section of FHWA Workforce Website

<http://www.nhi.fhwa.dot.gov/transworkforce/TWO.asp>

This recent (April 2005) overview identifies the importance of workforce issues in transportation and refers to many of the most important efforts under way to meet future challenges.

Workforce issues

- Baby boom retirements. Forty-two percent of state and local government employees are age 45 to 64.
- Transportation will have to compete for a smaller pool of qualified workers.
- New technology requires on-going training for transportation workers
- Downsizing, outsourcing and greater public interaction require new skill sets.
- A skilled workforce is the most effective way for transportation to keep pace with increasing demand.

Transportation demand

- U.S. population will grow by 20 million in the next five years to reach 300 million by 2010.
- Vehicle miles traveled is growing twice as fast as population
- Suburban sprawl creates new challenges in highway capacity, congestion and land use.
- More older drivers will require innovations in roadway design and safety.

Pressure on state DOTs

- 5.3% average decrease in fulltime employees
- 56% increase in budgets
- Reauthorization will give states more responsibility for program development and delivery

Workforce initiatives in the new highway bill (different provisions in House and Senate versions)

- FHWA core training and professional development – NHI, LTAP, Eisenhower Fellowships
- States can use major highway construction and maintenance funds for career outreach and in-service
- UTC funding increases
- Curriculum development funds
- Transportation Scholarship Program for undergrad and grad student degrees
- Garrett Morgan Program for career outreach

AASHTO

- Strategic Plan, Goal 4, Objective 4D. Develop tools to assist states in addressing issues of workforce recruitment, retention, succession planning, and in-service training. Provide state DOTs with expertise and resource materials to help them make effective decisions regarding a variety of personnel recruitment and development issues.
- Broad based initiative now under way to:
 - 1) Review research on in-service training
 - 2) Survey states for in-service training needs
 - 3) Conduct workshops for DOT human resource and training directors
 - 4) Produce summary report

LINKS TO DOCUMENTS

“Managing Change in State Departments of Transportation: Innovations in Work Force Strategies,” NCHRP Project 20-24(14), Robert Johns and Steve Lockwood, May 2001

http://gulliver.trb.org/publications/nchrp/nchrp_w39-5.pdf (full report)

“Help Wanted – Meeting the Need for Tomorrow’s Transportation Work Force,” Clark Martin, July/August 2001 issue of *Public Roads*

<http://www.tfhr.gov/pubrds/julaug01/helpwanted.htm>

This article by the workforce programs coordinator for FHWA’s Office of Professional and Corporate Development provides an in-depth assessment of the workforce development challenges and efforts to meet them.

National Workforce Summit – May 2002

“Filling the Pipeline,” Clark Martin and Vicki Glenn, November/December 2002 issue of *Public Roads*

<http://www.tfhr.gov/pubrds/02nov/02.htm>

This article describes the summit and provides a readable summary of key issues and USDOT plans.

International Scan. “European Practices in Transportation Workforce Development,” June 2003, scan co-chairs Joe Toole, Associate FHWA Administrator, and Pete Rahn, then New Mexico DOT Secretary, now Missouri DOT Director. The scan was conducted March-April 2001 in Sweden, Germany, France and England.

http://international.fhwa.dot.gov/Pdfs/converted_to_html/scanreports/workforce/executivesummary.htm

Findings and recommendations:

Career Awareness

- Develop industry-wide commitment and funding for programs to spark and sustain kindergarten-through-12th-grade students' interest in transportation careers.
- Develop a comprehensive, coordinated program to introduce high school and middle school teachers to transportation careers and issues.
- Continuously market the transportation industry's heroes and their success stories to young people.
- Identify core job characteristics entry-level workers seek in a job, and encourage employers in the transportation field to provide those characteristics.

Workforce Development

- Define critical leadership roles in the face of a changing transportation industry.
- Develop industry-wide mechanisms for developing these leadership competencies.
- Prepare employees to better understand how delivery of government services is changing.
- Craft new relationships, institutions, and funding sources to develop and ensure industry-wide practical competencies and skills in transportation workers and technicians.

Program Effectiveness

- Find a means of engaging the entire transportation industry in the workforce development process.
- Develop a self-sustaining model for collecting and disseminating best practices in the industry.
- Strive to integrate workforce development and retention into the key business processes of an organization.
- Establish a common framework for delivering and measuring all types of learning.

Recruitment

- Broaden and formalize relationships with high schools, vocational schools, and community colleges, which are key sources of transportation workers.
- Create a means for attracting more students to civil engineering and overcoming financial roadblocks.

NCHRP Synthesis 323, “Recruiting and Retaining Individuals in State Transportation Agencies,” Tom Warne (Tom Warne and Associates, former Utah DOT CEO)
http://trb.org/publications/nchrp/nchrp_syn_323.pdf

The synthesis relied on CEO interviews, an employer survey (Wisconsin was one of 24 states and three Canadian provinces responding), and an employee survey (only Maryland, Nebraska and Utah).

Conclusions:

- The economy and unemployment levels can significantly impact recruitment successes.
- Benefits and employment stability are recruitment pluses for state agencies, but these advantages aren't always communicated effectively to candidates.
- Offering training programs (potentially leading to professional engineering certification) is a good recruitment tool but can be negatively impacted by budget cuts.
- IT professionals need competitive salary packages at hire and throughout their careers.
- States need to understand how well they are measuring recruitment and retention efforts in order to improve them.
- Hard quantitative information on state DOT recruitment and retention programs is not available.
- Primary retention incentives are current salary levels, future salary opportunities and promotion opportunities.
- Special compensation or bonus programs probably help retain employees; flexible work hours, educational benefits and recognition programs probably don't.
- A certain percentage of state DOT employees will leave agency employment regardless of any retention activities.
- A percentage of those who leave state service can be recruited to return.
- Employees are not always certain that raises and promotions are based on performance.
- Low morale is present; however, most are proud to be public servants.

Wisconsin's responses to key questions on the employer survey (p. 51-59):

- **Strategies for recruiting engineers**

“Over the years, the department has established close working relationships with universities/colleges. This relationship has familiarized the professors with our operations, so that they speak favorably of the department and are a positive influence with the graduating engineers. In addition, we promote the hiring of engineering students during the summer. We also have a scholarship program to attract minority engineering students. We are also able to hire more experienced engineers above the minimum starting salary at a rate that is commensurate with their experience.”

- **Strategies for recruiting engineering technicians**

“The agency has several employees that teach at one of the technical schools in Milwaukee. In addition, we have a number of employees that are well connected to the technical schools that involve certification such as asphalt. This close relationship with the tech schools benefits the agency in attracting qualified applicants.”

- **Strategies for recruiting IT professionals**

“We have developed an expedited hiring process to get the job offer to desirable applicants before losing them to private industry due to a traditionally length hiring process.”

- **Strategies for recruiting other professionals**

“When we recruit planners, we have management personnel go to the college/university to talk with the class about our jobs.”

- **Impact of strategies**

“We have been able to attract more applicants than we normally would. Our engineering program is self-sustaining. We have employed a fair number of students in the summer engineering program and they enjoy the experience; consequently, they talk to other students and have positive things to say about the DOT program and a good number of these students end up working for us.”

- **Strategies for retention**

“The engineer is given responsibility to manage their respective project; the strategy is giving them a challenge. Using the leading techniques and equipment to carry out their responsibilities is a strategy. Keeping the pay competitive in relation to hours and (geographic) locations worked is a strategy. Additionally, there is automatic pay progression over a 2-year period that gives the employee a 15.5% increase in salary from the minimum starting rate. One year later, the employee receives an additional 8% of the pay range minimum. Flexibility in allowing/accommodating transfers to different parts of the state as their respective personal situation changes is also a strategy.”

- **Impact of retention strategies**

“Very low turnover for our engineers considering, from a pure pay perspective, she or he could earn substantially more in private industry.”

- **Other special programs for retention**

“Several classifications have pay ranges that are broad banded, meaning that there is greater flexibility in setting the hiring rate as opposed to being fixed at the minimum of the range or a fixed percent increase for promotion.”

- **External influences causing professionals to stay**

“Labor contracts have been negotiated giving employees greater increases for changes in classification and management greater pay flexibility upon hire or movement of people. Professionals in the engineering bargaining unit were given 1 week of paid time to pursue professional development.”

“The Workforce Challenge: Recruiting, Training, and Retaining Qualified Workers for Transportation and Transit Agencies,” TRB Special Report #275

<http://trb.org/publications/sr/sr275.pdf> (full report)

<http://www.nhi.fhwa.dot.gov/transworkforce/TRBStud.asp> (summary)

Key findings:

- Transportation agencies face retirements of senior-level managers nearly double the rate for the nation's entire workforce.
- The transportation workforce requires a wider range of skills and abilities than in the past because of changing and expanding agency missions as well as new technologies; this has coincided with level or decreasing staffing in transportation agencies.
- Agencies are significantly under investing in training their workforces.
- Organizations are finding it increasingly difficult to recruit and retain professionals and technicians.
- Few transportation agencies are positioning their human resource activities at a strategic level so the workforce needs described by the organization's strategic plan can be met.
- DOTs need to establish training as a key priority
- More federal surface transportation program funds should eligible for training and education activities.
- USDOT – with state DOTs, the private sector, education institutions, unions and employees – should undertake an initiative focused on innovation in human resource practices.
- State DOTs should join with universities, colleges, institutes and LTAPs for training needs.
- Agency leaders should make human resource management a key strategic function of their agencies.

“The Workforce Challenge,” Walter Diewald,, 2003 November/December issue of TR News

http://gulliver.trb.org/publications/trnews/trnews229_p27-30.pdf

This article summarizes TRB Special Report 275.

NCHRP 20-3, Task 163. “Innovative Practices in Workforce Development for State Departments of Transportation,” Bergstrahl, Shaw, Newman.

<http://www.nhi.fhwa.dot.gov/transworkforce/innovative.asp>

The results of this project include the following 16 workforce management best practices in five key areas. Four-page summaries of each practice are posted on the FHWA Web site (above).

Recruitment

- Colorado T-REX – Learning Transportation
- Iowa CoolCareers Program
- Kentucky Kentucky Transportation Cabinet Civil Engineering Scholarship Program
- New York Putting a Face on the New York State DOT
- North Dakota Engineers by Design

Retention

- Maine Workplace Respect Project: Changing a Work Culture
- New Hampshire Benchmarking Hiring Process Saves Time and Employees
- Pennsylvania Monitoring the Pulse of Employees

Staff Development

- California Work Breakdown Structure
- Connecticut Developing an In-House Approach to Leadership

- Idaho Training Your Own Technology Staff
- Louisiana Proposed Master of Civil Engineering Professional Degree
- Minnesota Strategic Staffing Model Plan

Organizational Change

- Florida Model Personnel Classification and Compensation Plan Becomes State Mandate
- Kentucky Empower Kentucky

Succession Planning

- Minnesota Succession Planning – Building Leadership Capacity